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ABSTRACT

Researchers have suggested that many low-achieving students lack planning skills and self-direction. In this study, goal-setting techniques were used to provide self-management for fourth-grade mathematics students lacking planning skills. While all 30 students in the classroom participated in the project, 5 boys who had low mathematics diagnostic test scores and who exhibited poor organizational skills and appeared to lack focus and concentration were selected as target students. Students were presented with a step-by-step goal-setting procedure to follow. The goal-setting intervention included 8 introductory sessions over a 3-week period, a mathematics diagnostic test, 5 large-group and 15 small-group meetings over a 15-week period, and a midyear mathematics diagnostic test. Baseline data were obtained from the first diagnostic test. Daily grades, unit test scores, and unit grade averages over the 15-week period provided interim data. Post-test data came from the midyear diagnostic test. The results revealed that the specific goal of increasing mathematics achievement with low achievers was not met; only one of the five targeted students showed improvement in test scores. Goal-setting did, however, appear to motivate students to accept more responsibility for their education and behavior, and it proved most helpful to the inconsistent achievers. (NB)

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GOAL-SETTING AS A MOTIVATIONAL TECHNIQUE

By

J. Betty Piirto

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CHAPTER I: BACKGROUND OF THE STUDY

Focus

The purpose of this study was to examine the use of student goal-setting as a motivational technique in the fourth-grade mathematics curriculum. More specifically, would the use of goal-setting techniques by low-achieving fourth-grade students motivate them to improve their mathematics averages on daily work and increase their raw scores on the district diagnostic test?

"Goal-setting," for this project, was defined as a multi-step procedure used to reach a stated objective. (Note: This procedure is described in the section entitled "Research Design and Methods.") "Low-achieving" refers to those students who score in the lowest twenty-five percent of the Racine Unified District Diagnostic math test.

Rationale

Researchers (Bernabei, 1970; Gearheart, 1985; Sund, 1972) suggest that many low-achieving students lack planning skills and self-direction. For over twenty-five years as a classroom teacher, I have observed and contrasted the planning skills of high- and low-achieving students. High-achieving students usually exhibit a well-defined sense of organization and are able to proceed toward a goal with little or no special help from the teacher.

On the other hand, children at the low end of the achievement scale who lack self management skills find that the simple act of getting ready to begin an assignment can be a difficult procedure. While these children may express a desire to improve their skills, their actions indicate a lack of determination in fulfilling their expressed desire. Some children even appear to place obstacles in the way of their progress.

Goal-setting techniques provided a type of self-management for each child who lacks planning skills. The system presented students with a step-by-step procedure to follow when their own planning ability proved inadequate. By using this procedure, low-achieving children would have an improved opportunity for increasing achievement levels.

As I have previously observed, a low-achiever enjoys being successful. Gaining the ability to help themselves toward desired goals could be a motivating factor for increasing academic achievement.

Research Design & Methods

While all of the children in the classroom participated in the project, the targeted students were those who scored in the bottom quarter of the Racine Unified District mathematics diagnostic test administered in the fall, 1986.

The study began in September with eight introductory sessions over a three-week period. Immediately following the math diagnostic test at the end of September, the project proceeded for fifteen weeks

and included five large-group and fifteen small-group meetings. The study ended with the midyear mathematics diagnostic test in February, 1987.

A prediction exercise done with the entire class began the project. Such exercises were used to begin similar studies (Alschuler, Tabor, & McIntyre, 1970; Tollefson, Tracy, Johnson, and Farmer, 1984), and eventually led each student in the project to set an individual goal for mathematics achievement. In small groups, the children practiced goal-setting by completing a form (see Appendix A) requiring them to set a goal and list specific actions to reach the goal, such as: 1) the amount of time to be spent on the activity, 2) where the activity was to take place, and 3) who could help (if help was needed).

After using their plan, children evaluated the effectiveness of their specified action in order to decide whether or not the activity needed to be revised before continuing. This procedure also took place in small groups facilitated by the teacher. At all times the children were responsible for making their own decisions.

To further guide students in their decision-making processes individual graphs of weekly grade averages were kept. Individual graphs for the average grade of each unit also enabled students and teacher to compare past and present progress.

Results from the district diagnostic test administered in September, 1986, constituted baseline data. These data included (1) raw scores, (2) percent correct, (3) diagnostic levels (mastery,

instructional, frustrational), (4) areas of strength, and (5) areas of weakness.

Interim data were collected for fifteen weeks. These data served as part of the monitoring system for goal-setting and included daily grades, unit test scores, and the grade average of each unit (Note: Units are from two to four weeks in length). On-going analyses were done by comparing results from each of the math units, using bar graphs.

The midyear district diagnostic test (administered in February, 1987) was used to provide post-test data. The results were compared to the pre-test data of September, 1986, to determine any increase in mathematics achievement. The entire study took place over approximately four months.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

Dan C. Lortie, in his book Schoolteacher (1975), explains the gradual change in the American schools from their inception to the present time. One point he makes is that early teachers used physical force to control their students. At about the time compulsary education was introduced, limits were placed on physical force and teachers were faced with controlling students who had no desire to be in school. The teachers were encouraged to "inspire" their pupils to learn. How to accomplish this feat became the teacher's new problem.

Pedagogical inspiration - commonly referred to as motivation - has since become a subject of study by psychologists and educators alike. Using goal-setting as a motivational technique is the focus of this paper. This investigation of goal-setting focuses on achievement motivation. Achievement motivation, in this review, refers to the inner drive (or incentive) which causes an individual to pursue and complete a stated goal. The studies reviewed in this chapter examine the goal-setting techniques of individuals and factors that influence goal-setting.

Early Studies in Achievement Motivation

Early motivational studies dealt with survival motives, such as hunger and thirst. David C. McClelland, author of The Achieving

Society (1951), rejected survival as the only motive. In the late 1940's, he began the research of achievement motivation along with John C. Atkinson, Russell A. Clark, and Edgar L. Lowell. Their work, The Achievement Motive (1953), discusses the risk-taking behavior of male college students. They found that high achievers chose medium-risk goals, the goals which one would expect to achieve with effort. High achievers rejected easy goals which require little effort, and difficult goals which offer little chance of success. Low achievers selected either easy goals, in order to be assured of success, or difficult goals because failure would not cause loss of prestige. They rejected medium-risk goals. In short, high achievers are motivated by expectancy of success and choose medium-risk goals, while low achievers are motivated by fear of failure and choose low- or high-risk goals.

Related Studies

Atkinson (1966) further investigated the persistance or "striving" of achievers, first examined by McClelland, et. al. (1953). Norman T. Feather (1966) examined the relationship of persistence to expectation of success. Other factors effecting the achievement motive (e.g. competition, games of chance, ability grouping, test conditions) are presented in the research included in A Theory of Achievement Motivation (Atkinson and Feather, 1966).

The achievement motives of elementary school children are presented in a series of studies entitled Achievement-Related Motives

in Children (Smith, (1969). These studies trace the development of motive in young children from improving on their own past work to the comparing of their ability (competency) to that of their classmates. This change in self-evaluation signals the beginning of the fear of failure as a motive (Veroff, 1969). Later studies discuss relationships between self-worth and achievement motivation (Covington, 1984) and the difference (easy-difficult) in the choices made by fear of failure individuals (Nicholls, 1984).

Practicing Achievement Motivation

How to translate the findings of these many studies into practice is explained in Teaching Achievement Motivation (Alschuler, Tabor, and McIntyre, 1970). The study offers suggestions on teacher training and workshops. Johnson (1984) has written a book for parents on raising achievement motivated children. In addition to his pioneer research in the theory of achievement motivation, McClelland was joined by Johnson in the development of Learning to Achieve (1984), a series of workbooks for grades four through twelve. These books incorporate methods to be used by students in acquiring skills necessary for successful achievement of their goals.

PIONEERING RESEARCH IN ACHIEVEMENT MOTIVATION

The studies in this review are based on the work done by David C. McClelland, John W. Atkinson, Russell A. Clark and Edgar L. Lowell as reported in The Achievement Motive (1953). This review begins with this pioneering research.

Early studies of human motivation reported survival as the only motive for pursuing and completing a goal. McClelland rejected this belief and argued that, among other possible reasons, desire for success (achievement) was a factor in motivation (Atkinson, 1966). Together with his colleagues, McClelland began an emperical study of motivation in the late 1940's. The subjects were six hundred male college students. (Note: The females in the co-ed population were tested at the same time, but their results were not included in the original study.) The Thematic Apperception Test (TAT) which measures motives of achievement, sex and power was used to establish the achievement levels of the subjects. Students wrote imaginative stories suggested by stimulating pictures. Each story had to include answers to a set of questions and be completed within a time limit. The test was designed to be influenced by events occuring prior to the writing of the stories. This was accomplished by administrating it under a variety of situations which included: relaxed, neutral, achievement-oriented, success, failure, and success-failure orientations. Results indicated that high achievers used more anticipatory clauses while low achievers recognized more obstacles. In word recognition tests, high achievers used more achieving words. These findings were interpreted as demonstrations of failure avoidance behavior (see below).

When the subjects described their up bringing and their parents, the highest correlation was found to be with high achievers who reported feelings of being rejected by their fathers. The mothers of

high achievers were found to have demanded more independent behavior at an earlier age and to have been less restrictive. They stressed a "standard of excellence," not competition with others. The mothers encouraged their children to set their own standards and did not interfere with the children's selection of friends. Low achievers reported friendly relations with their fathers. Their mothers demanded less early skill development, were more restrictive, and were more likely to pass judgement on their children's friends.

Several replications of the original work were conducted and their results included in the 1953 report. It was found, for example, that achievement motivated children on a Navaho reservation developed early independence and survival skills as a result of what these researchers perceived to be "childhood neglect." Testing students at a woman's college, the researchers found that the achievement motive of women was increased by social acceptance, but not by leadership or intelligence situations. Would the test results of the women attending a co-ed college have been the same? In the late 1940's few women attended college and fewer still attended co-ed colleges. Might these women have been motivated by something other than social acceptance? These and other questions appear to have been largely inconsequential to McClelland et. al. at the time.

The subjects in the study made a series of task choices from those presented to them (in a variety of situations such as: success, failure, neutral, etc.) by the researchers. The subjects' choices were then interpreted as risk-taking and goal-setting behaviors.

This investigation of the risk-taking and goal-setting behavior of high and low achievers produced the following results. High achievers select medium-risk goals which are challenging but achievable with effort. They have no interest in low-risk goals (which lack challenge) and reject high-risk goals (which have a low chance of success). Low achievers select low-risk goals because they produce easy success and/or high-risk goals because failure will not cause embarrassment. They do not choose medium-risk goals because those afford the greatest chance of effort not equaling success - which then results in humiliation. This choice selection process by low achievers is called failure avoidance behavior.

When high achievers succeed at a task they loose interest in it and move to the next, more difficult step. When they fail at a task they also loose interest and proceed to some new task. Because the original study was done in college, it is probable that the number of low achievers would be fewer than at other school levels. This fact raises an interesting question: Would the characteristics of college low achievers, who have reached a level of success by attending college, be the same as those in grade or high school where attendance is compulsory and carries no prestige?

RELATED STUDIES WITH COLLEGE STUDENTS

Atkinson and Feather (1966) examine the relationships of incentive, expectance of success, strength of motive, and striving, to achievement motivation. Atkinson (1966) defines incentive as the

"relative attractiveness or unattractiveness of a goal or event that might occur as a consequence of some act" (p. 12). He names achievement, power and affiliation as classes of incentive (motive). When high achievers are successful at a task, their next task choice will be one step up in difficulty. If a high achiever fails at a task, the next task choice will be one step down in difficulty. The choice of tasks, then, will differ according to the perceived difficulty of the subject (Moulton, 1966).

Expectancy of success is aroused by situational cues (McClelland, et. al. 1953; Atkinson, 1966) and what a person believes is probable. Expectation decreases as a subject works at the initial task unsuccessfully, and when the expectation changes so does the motivation. High achievers believe they'll win more than fail, while low achievers believe they'll fail more than succeed.

The strength of a motive is the disposition of an individual to strive for a certain kind of satisfaction and is related to the individual's goal-directed activity. Atkinson (1966) says that motive is a relatively general and stable characteristic of personality and originated in early childhood.

Striving is a tendancy to persist and interacts with the stable aspects of personality in each different situation (Atkinson, 1966). Feather (1966) found that the striving tendancy of high achievers increases when success is expected and decreases as the task becomes unsuccessful. For the low achiever, persistance is greater with a difficult task. For both high and low achievers, motivation

decreases as the number of failure increases. In short, items considered in a task choice are based upon the achievement values of the individual, the structure of the task, whether there is commitment to complete the task, and the difference in each situation involved (Feather, 1966).

College teachers report high achievers receive more pleasure and have a greater expectation of success (Litwin, 1966). In the classroom, high achievers approach a task with interest and intent to achieve, and exhibit a higher level of performance. They are more persistant in task completion and more realistic about their past performances, which aids them in goal selection. High achievers are observed as being more confident and enthusiastic. They select medium-risk goals, loose interest when successful, and move to a new activity (Atkinson and Feather, 1966). The selection of medium-risk goals does not apply to games of chance, however, because there is no standard of excellence, no skill (control) and no sense of accomplishment (Littig, 1966).

Low achievers suffer decrements in performance level because their negative fear of failure is stronger than their positive feeling of achievement (Atkinson, 1966). Their interest in a task increases with success, but they expect failure more often than success (Litwin, 1966). Their avoidance behavior is defensive. Low achievers avoid failure at all costs and would rather withdraw than participate. This behavior is strongest with medium-risk goals and competitive situations with peers. If they are forced to participate by social

pressure their performance suffers because of the avoidance tendancy (Atkinson and Litwin, 1966). Low achievers are frightened away by failure at an easy task will persist at an improbable task. Research suggests that very strong motivation and reinforcement may improve their performance somewhat (Atkinson and Feather, 1966).

RELATED STUDIES WITH YOUNG CHILDREN

Motives related to achievement in young children develop in stages, according to Veroff (1969). The first stage, automomous competence, begins with the development of language between the ages of one and a half and two and a half. As children begin feeling pleasure in accomplishments and understanding their progress, they begin the process of internalizing personal standards.

Smith (1969) investigated the parental training of high and low achieving elementary school children. As with the college subjects in earlier studies, it was discovered that early skill development and independence was expected of high achievers. Their parents described them as obedient, skilled at athletics and good in competitive games. These children stood up for their rights and those of others, but were generally rated low in exploration and curiosity. Parents of high achievers made infrequent use of physical love but encouraged their children by words and enthusiasm. They also encouraged internal control and partial success when full success was not possible. These parents rarely displayed anger with their children or shouted at them. (Note: It would seem from the description of these children that

there would be little reason for anger or shouting.) High achieving children rated themselves as responsible.

Parents of low achievers reported expressing lots of physical love. Children were often urged to improve performance because their parents expected better. These parents rated their children low in independence, obedience and the ability to control their emotions. Parents of low achievers exerted external control. The children rated themselves as nervous, lazy, less intelligent and less competent than their peers. They held a generally low self concept of themselves (Smith, 1969).

One explanation of the difference in the use of physical love might be found in the nature of the children themselves. A confident, responsible child would appear to need the comfort of physical love much less than would a nervous, uncertain child. If low and high achievers occur in the same family would the parents respond in the same manner to both?

Social comparison, the second stage of achievement motivation, begins in the early school years. It usually does not develop in the very young because they are too egocentric. The first school experience can reassure or not assure children of their own standards and autonomy. Children are informed of their relationship to the world as the basis for their standard of excellence shifts to social comparison (Veroff, 1969).

In their first four years children develop independently of social or parental approval and receive pleasure from their

activities, not from external rewards. Nicholls (1984) describes this as task involvement. Schooling promotes a gradual increase of achievement motivation from grades one through six. According to Smith (1969), boys' autonomous scores increase until the third grade and then decrease, while girls' autonomous scores increase until the fourth grade and then drop off. Failure avoidance behavior increases from grades one through five and has a debilitating effect on the performance level of children (Smith, 1969).

If the first two stages, autonomous competency and social comparison develop properly, the third stage is their integration. They are not fused but will vary in strength according to the situation (Veroff, 1969).

Use of ability grouping in schools helps high achievers increase their achievement and interest in subject matter. Low achievers continue to achieve at the same level when grouped according to ability but lose interest in the subject. They tend to compare themselves to the high/low structure as well as to their classmates (O'Connor, Atkinson, and Horner, 1966). The difference in benefits for high and low achievers should be taken into account when ability grouping is being considered by school organizations.

Covington (1984) describes the self-worth of high and low achievers. High achievers take credit for their success and attribute it to their ability. "Ability equals success" becomes part of their self-definition. On the other hand, low achievers attribute success to luck and failure to lack of ability. "Low ability equals failure"

becomes a part of their self-definition and cuts them off from a major source of esteem in a society where personal worth depends upon accomplishment.

Nicholls (1984) describes tasks a either ego involved (comparing to others) or task involved (strong feelings of competence). Young children believe high effort equals accomplishment. Covington (1984), for example, found that teachers reward effort and punish lack of effort for both the bright and not so bright student. In the early years of school, therefore, children expect high effort to bring success. With their increased concern about teacher and peer evaluation, children begin to develop the differentiated concept as presented by Nicholls (1984). This differentiation results from self-evaluated and social comparison. Older children begin to realize that high effort and length of time on task implies low ability. As previously stated, children motivated by fear of failure select either low-or high-risk goals. Thus, if children suspect but are not certain of their low ability, they will choose the high-risk task because the expectation of success is low and failure does not indicate low ability. However, if children are certain of their low ability, they will first try to avoid the task by using any excuse possible. If that fails, they will choose the easiest task as the best method of avoiding the situation. To increase achievement, therefore, Nicholls (1984) suggests less competition, more task involvement and fewer ego-involved tasks. The cooperative learning

advocates (see for example, Deutsch [1949]) suggest using less competition to help increase achievement.

THE APPLICATION OF ACHIEVEMENT MOTIVATION

McClelland, believing achievement can be taught, collaborated with Eric W. Johnson, an experienced teacher and administrator, and developed a set of workbooks (McClelland and Johnson, 1984) used in the fourth through twelfth grades. Each book is divided into six sections: 1) studying yourself, 2) getting goal ideas, 3) setting goals, 4) planning to achieve, 5) striving, and 6) evaluating performance. Games, exercises, stories and discussions are provided for each of the six sections in an attempt to put the theory of achievement motivation into practice.

Johnson, using material from the workbooks as a basis, extended the development of the achievement motive into the home with a book of advice for parents (1984). In it he summarizes the characteristics that combine to produce achievers. These individuals are good at calculating success, taking obstacles into account, planning, finding and using help, striving, and checking their progress. They compete with their past record, enjoy achieving and hold an internal standard of excellence. Along with Johnson, Alschuler, et al. (1970) describe high achievers as being self-relient, self-confident, realistic about their strengths and weaknesses, and responsible for their actions. High achievers relate present actions to their past performances and set challenging but possible goals.

To help develop achievers, teachers and parents should use role models (Alschuler, et al., 1970) and discuss the many characteristics of the success-orientated individual. Johnson (1984) suggests other topics for discussion, including how goals are achieved, how to improve achievement and how to learn from failure situations. He also provides games for self-competition and suggests sessions for brainstorming and defining long and short term goals. Practice in predicting and estimating opportunities for success are also valuable exercises. Children should be encouraged to set their own goals and make imposed goals (school, community) their own.

SUMMARY

The studies in this chapter examine the differences in the decision-making processes of high and low achievers. A comparison of their upbringing was included. Early independance and skill development was common for high achievers, while low achievers were found to be more dependent and emotional (McClelland, et al., 1953; Smith, 1969).

The achievement motive develops in three stages. The first stage is autonomous competency, during which children are task involved (Nicholls, 1984) and begin to understand their progress and internalize standards. The second stage is social comparison, during which school age children begin to compare their progress with others and respond to teacher evaluation. The third stage is the integration of the first two, during which predominance of one or the other

depends upon the situation (Veroff, 1969). The achievement motive increases from grades one through six, as does failure avoidance behavior. The avoidance behavior exhibits itself in low level performance or no performance at all.

The Covington study (1984) found that "ability equals success" is a part of a high achiever's self definition, while "low ability equals failure" is part of a low achiever's self-definition. Both Covington (1984) and Nicholls (1984) found that younger children equate effort with success while older children equate length of time and intensity of effort spent on task with failure.

McClelland and educator Eric W. Johnson (1984) developed a student workbook for school use. Its purpose is to help children develop the skills necessary to become part of our achieving society. Johnson (1984) went on to describe high achievers and provide stratagies for parents to follow in developing children with the desire and ability to achieve.

As noted in the first chapter of this project, low achievers lack organizational skills. When approaching a task, they often appear to place obstacles in the way of their progress. Research on the achievement motive refers to this as failure avoidance behavior. Strategies and materials gleaned from the achievement motivation literature, along with materials specifically designed for this study, were used in an attempt to modify or replace such behavior with the achievement motive. In the following chapter, the results of this study are presented in detail.

CHAPTER III: THE STUDY

Introduction

This study concentrated on the goal-setting aspect of achievement motivation. The purpose of the project was to examine the motivational properties of goal-setting on fourth grade students as related to the mathematics curriculum.

Procedure

The class was made up of thirty children (fifteen girls and fifteen boys). The group was fairly stable with the four new students entering early in the study, prior to the individualized goal-setting excercises.

To begin the study it was necessary to introduce the concept of low-, medium-, and high-risk goals (See Chapter II). Ring-toss, a game used in achievement motivation research (McClelland, 1953) as a predicting exercise, was the first step. Observing how they played the game enabled me to see which children would predict the goal with the greatest chance of success.

The scoring system was set up so that from three feet away the children could earn one point per toss, from six feet - three points and twelve feet - ten points. To familiarize them with the game, three practice sessions were held before the game was played for points. None of the group chose the easiest toss but eleven of the

fifteen who chose the three point position, scored. No one scored from the ten point position. In this last group were four of the eventually targeted pupils. (According to Nicholls' differentiated concept [1984], this would indicate none of them had yet developed certain feelings of low-ability.) Two concepts necessary to the project were introduced to the children by analyzing the scoring of the game. They were predicting one's own ability to succeed (no one scored from twelve feet in practice either) and the value of low-, medium-, and high-risk goals (See Chapter II).

Using some of the suggestions from Raising Children to Achieve (Johnson, 1984) and the teacher's edition of Learning to Achieve (Johnson and McClelland, 1984) I introduced the class to the six steps presented in those books as guides to achievement. The steps were: 1) study yourself, 2) get goal ideas, 3) set a goal, 4) plan how to achieve the goal, 5) strive to achieve the goal and 6) evaluate how you achieve. A bulletin board with the "ladder to success" listing the steps was on display from the first day of school and remained throughout the project. Following the introduction each step was more fully developed in six separate discussion sessions.

Together in these discussions we defined achievement as "working hard at something you want to do and getting it done." Characteristics of achievers were listed ("gets work done on time" - "is responsible") and feelings of achievement ("good" - "proud") were described. The children wrote down a strength, weakness and a past achievement. (The last was the most difficult and over half of the children did

not complete it - including high-achievers - even though possibilities had been discussed.)

Continuing in large group discussions, goals were brainstormed and the children set subject-related goals of their choice. Tasks needed to be completed in reaching the goals were listed and a date for completion was set. Methods for striving were developed and selected by individuals. Evaluation began on the completion date. Reasons for success or failure, adjustments in tasks or striving methods, help needed and learning from failure were subjects discussed. At this point the idea of considering failure as a step toward success was developed and continued to be emphasized during the entire project. These discussions provided the basis for the individualized goal-setting to follow.

At the end of four weeks, target students were selected from the test results of the Racine Unified District Math Diagnostic Test (See Chapter I). This test is administered to all fourth grade students after a fifteen day review curriculum provided by the district. The target group was composed of five boys who not only had low test scores but exhibited poor organizational skills and appeared to lack focus and concentration.

To begin the goal-setting process I selected six students at a time to meet with me. Because of "pull-out" programs, absences and other considerations, these groups did not remain constant. They used a goal-setting form (See Appendix A), and I directed them to their first math goal - helping them to base the goal on the results

of the math review unit. The children needed to answer how, where, when, who (would be a help if needed) as part of the planning. The goals were short-term, to be evaluated in one week.

Examples of the goals were:

Practice my addition facts 1-18 so that I can do them without using my fingers

1. ten minutes each night after dinner
2. in my room
3. use flash cards
4. Mom will check me on Wednesday and Friday

and, raise my grade average by checking my work

1. fifteen minutes right after school
2. at the kitchen table
3. go over all my answers
4. ask my brother to help if I have trouble.

Although I gave suggestions, the children had to develop their own plan. It was important the goal be realistic to them, as well as to me, and that the plan be workable for them. Until they became independent I discouraged plans that called for more than twenty minutes of study a night.

Evaluation - analyzing the plan and determining the degree of success - took place in the same size small groups (as stated, group make-up varied). Partial success meant adjusting the plan or the goal. Lack of success was considered an important finding because students could learn something about themselves from that experience.

We questioned where the break down occurred: Was the goal too high? Not enough time? Require more striving? Need more help? Findings were not judged as good or bad but simply seen as part of the evaluation process.

These small group meetings continued throughout the study, but as the pupils became more efficient, my input was reduced. In order to help select realistic math goals, the children kept (with my help) weekly averages on a line graph and unit averages on a bar graph. Eventually, most students (including the target group) required little or no direction while three desired direction even at the end of the project. Independence occurred at different times. Some children were eager to be on their own, while others were cautious and needed encouragement.

Large group discussions and reviews of the six-step guide were interspersed at two or three week intervals. This also gave the children the opportunity to share successful methods and feelings about the project.

Findings and Interpretations

As previously stated, the target students were chosen from the test results of the Racine Diagnostic Math Test administered in late September, 1986. The research (but not the project) ended with the results of the math diagnostic test administered (again to all fourth grades) in February, 1987.

Of the five selected students (Hereafter referred to as Arthur, Bill, Carl, Donald and Evan), only one made significant improvement.

Bill who had twenty-one out of forty items correct on the first test (mean raw score 32.43), had thirty-four out of forty items correct on the second test (mean raw score 33.10). Arthur remained the same while Carl, Donald and Evan dropped by three, six, and one items respectively.

This is not to say that these children did not derive some benefit from goal-setting. For example Evan's grades were inconsistent, ranging from D to B. His achievement pattern was hit and miss. By improving his planning skills through goal setting, Evan was able to become more consistent and eventually stabilized his grades in the high C to B range. Donald, a child on medication for hyperactivity, made specific use of goal-setting to improve his reading comprehension and raised that grade from F to C. Most of his achievement, however, varied with changes in his medication.

Both students Arthur and Carl, on the other hand, required more time than any of the other students in developing this ability. Only after the research ended did they begin to reach their goals. Using this method of setting personal goals, they were able to pass several spelling, vocabulary and multiplication tests. It should be noted that both of these students are low-achievers in all subject areas. Setting realistic goals was frustrating for them in the beginning of the project and they needed to be more gently led than the others.

Not surprisingly, the high achievers in the class had the greatest success. The raw score increases of the top ten students ranged from zero to thirteen items, with four being the average increase.

This group was enthusiastic about the program from the start. Within the first two weeks they were using goal-setting for personal goals as well as for subjects other than math. The majority of the children (excluding Arthur, Carl and Evan) took one to two months to develop this kind of independence.

This method was particularly effective for pupils who are inconsistent achievers. This step-by-step process, which they would establish for themselves, appears to have given them the control over their achievement they did not know they had. Members of this group (there were six) would frequently check on their grades and ask for help in making adjustments and evaluations of their progress. They also were more likely to share the news of their achievement with others (parents, peers, teacher) and express pleasure with their accomplishments. The comment, "I never knew I could do this," often accompanied their success.

Use of goal-setting spread to behaviors as the children became more independent in its use. One boy, for example, was tired of not being able to locate his completed work. He chose to change this by reorganizing his materials. After several attempts, he not only found a workable system but has not since had any late assignments (three months). Others used it to make new friends, increase voice volume and stop inappropriate talking. Some success was minor and some temporary, but these attempts suggest that children felt they were responsible for and could take control of those behaviors.

Most of the children (about two-thirds) shared information with me about their goal-setting as the study progressed. When it ended I interviewed them in small groups to gather more of their thoughts and feelings about the experience. The interviews revealed that seventeen children extended the use of goal-setting outside of school. Some told of using it to develop their skills in various sports and trying to earn a position on a team. Others spoke of completing their household chores and one slender girl is using this method to gain weight. One child, who takes dancing lessons, used the process to increase the length of her practice sessions, while another girl has stopped "smarting off" to her mother.

A few of these non-academic goals have been deemed a success by the participants but more remain in process. Interestingly all of these children felt they would accomplish their goal either by trying new plans or by continued striving.

Twelve pupils said, at the conclusion of the study that goal-setting made them study harder and more often. Ten mentioned being better organized and using planning to accomplish tasks. Three children said they no longer hesitated to ask for help and one said she was no longer embarassed when trying something new.

Eleven pupils claimed the most important thing they learned was that they could achieve. They expressed this in various ways, such as:

"You can achieve if you want to."

"Keep trying and don't give up."

"If I work at something I can do it."

"I found I could make myself do better."

"If you can't do something, just keep working at it and then you can."

"If you keep studying you'll learn it."

One of these comments came from Carl of the target group. The others reflect the feeling of average to high-achievers.

Upon completion of the study, just as I had at the outset, I asked the class to list a strength, a weakness and a past achievement. The difference in the responses was notable. This time everyone listed a past achievement. These achievements were real and most of them recent. They ranged from "got 100 on my spelling test three weeks in a row," to "earned my advanced beginners certificate in swimming." Their approach to compiling the list also differed, from great "pondering" in September, to just doing it in February.

The children exhibited a variety of effects from the goal-setting experience. The high-achievers had probably already been using it unknowingly. It was, therefore, easy for them to take it and make it their own. Their natural curiosity had them experimenting with it in their personal lives almost from the start. Since they were realistic goal setters they were nearly always successful in their attempts at something new. The "revelation" most of them developed was that planning brought achievement.

The children in the average grade range were less enthusiastic in the beginning, but gained enthusiasm with each success. The six

students mentioned earlier who had often teetered on the brink of a C, B or A grade appeared to have the greatest feelings of accomplishment when they succeeded in a task. They had often been told they were capable of doing better but apparently did not know how to get better. Learning about planning and striving brought them control they did not know they had.

As with many of their endeavors, the low-achievers had the greatest difficulties with goal-setting, largely because they brought to the task an assortment of problems. As mentioned, one was hyperactive and on medication. Another was emotionally disturbed and under the care of a psychiatrist. Still another is being tested for learning disabilities. Oddly, Bill, who demonstrated the greatest success, disliked the project. Although he cooperated he felt it was invasive. Evan made good progress but did not demonstrate this on the diagnostic exam. His math average for classwork during the study was 82%, while his test dropped from 73% to 70% (not significant). He and his parents expressed satisfaction with his accomplishments on several occasions. Arthur started by being extremely frustrated at having something more to do. Both Arthur and Carl had difficulty setting realistic goals. Persuading them to strive and follow their plans took much time and effort.

Low-achievers require closer attention, more direction and take a longer time than other students to learn new material. These same needs were demonstrated in this project. To form an accurate conclusion about their progress would require a study of longer duration.

Goal-setting did motivate most of the children in the top two-thirds of the class to higher achievement in one or more areas. Regular feedback on their progress was of help to those who did not understand realistic goals, though not all of the children required regular feedback to be realistic. Most of these children developed a better idea of the strengths and weaknesses. Some of them used goal-setting to try and change social behaviors, and over half used the method for personal achievement. It appears that the majority of the children have developed a better understanding of themselves and their abilities. Many of them began to appreciate their responsibility in their own achievement.

This study was not long enough to discover whether students will continue to use goal-setting, use it to set more challenging goals or become more accurate long-term planners. To be answered, such questions would need a follow up study.

Conclusion

Goal-setting can be helpful to many children. They will not all be helped in the same way or to the same degree, but most will derive some benefit. The characteristics of high-achievers are observable in most classrooms. They set realistic goals, are planners, understand themselves, are responsible, are self-starters and take pride in their accomplishments. They know themselves and have a positive self-image.

Goal-setting is one method of developing many of those same attributes in students with lower achievement levels. It provides a

tool with which they can work. While it does not necessarily raise achievement levels, at least not at the beginning, it can awaken students to their abilities. Goal-setting can and does encourage many to start taking an active part in their education. When children begin to understand themselves better they begin to feel more positive about themselves.

In this study, goal-setting proved to be most helpful to the inconsistent student by providing control, greater confidence and pleasure in achievement.

The low-achievers exhibited typical failure avoidance behavior. Inability to find materials, "forgetting" work, "losing" assignments, stuffed desks and broken pencils were all part of their defense systems. These behaviors develop over a long period of time and require considerable time to overcome. It might be wise to make these behaviors part of the goal-setting from early on in the project. Another suggestion would be to have these children set goals from one day to the next and evaluate each day. Since they usually work better on a one-to-one basis, individual conferencing might be more productive than the small group meetings. These pupils also require a longer time to develop their skills, probably longer than one school year.

This procedure did not reach the specific goal of increasing math achievement with the low-achievers as measured by the math diagnostic test. It did, however, motivate pupils to accept more responsibility for their education and behavior. At the conclusion of the project twenty-nine of the thirty students expressed positive

feelings about the experience. This suggests that goal-setting is a worthwhile project. When asked whether or not they would continue using the technique, twenty-three students thought they would, two were uncertain and five said they wouldn't (but did not know why).

Suggestions for further study would include research of a longer duration which would observe continued use and development of goal-setting. Does it become more individualized with continued use and if so how does it change? How does it effect the accuracy of long-term planning?

Another research approach might be to measure the growth of self-confidence and self-worth. The children in this study indicated they felt better about themselves as they became more aware of their strengths and weaknesses (even if heavy on the weakness side). Is this an accurate observation? How can it be employed in education? Does it have value for educators?

A close examination of children's planning skills and the development of those skills might prove to be of value to teachers. The children in this project seemed most excited about the idea of planning. Perhaps with more insight into these skills we could be more effective guides through the educational process.

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APPENDIX A

APPENDIX - SAMPLE PLANNING FORM

Name _____

MY PLAN

My goal: _____

_____

How I plan to reach it:

Steps: 1. What: _____

_____

2. When: _____

_____

3. Where: _____

_____

4. Who: _____

_____

5. Evaluate: _____

_____

6. Changes: a) _____

b) _____

c) _____